racy to be 18·2405 inches (English). The Hebrew ordinary cubit will therefore be 6 palms, *i. e.* six-fifths of this, or 21·8886 inches = 1·82405 feet, which agrees with Arbuthnot's estimate, $1^{f}\cdot824$.

In the treatise, *Pesachim*, פְּסָחִים of the Talmud, fol. 94 recto, we find it stated, that the circumference of the Earth is 6000 פַּרְסִין, or Parasangs.* Now a Parasang, פַּרְסָה, is = 12,000 אַמּוֹת (or אַמִּין, for both forms of the plural occur), or cubits; whence we have,

$$\text{One } \text{אַמָּה}, \text{ or Cubit} = 2 \cdot \pi \cdot \frac{\text{Radius of Earth}}{72{,}000{,}000}.$$

The latest and, I believe, most reliable determination of the dimensions of the Earth, that I know of, is that of the English *Topographical Corps*, published by Colonel Clarke. If we take the equatorial semidiameter there given as our radius of the Earth, we have

$$\text{Cubit} = 2 \cdot \pi \cdot \frac{20{,}926{,}062}{72{,}000{,}000} \text{ ft.}$$
$$= 1^{f}\cdot82572,$$

differing from the true value, $1^{f}\cdot82405$, determined by Sir Henry James only by $0^{f}\cdot00167 = 0^{in}\cdot02$, or the 50th part of an inch.

To make an exact agreement would require a radius of 20,906,885 ft., which is somewhat greater than the mean between Col. Clarke's equatorial and polar semi-axis.

This, however, at any rate seems to show that the ancient Rabbins were in possession of a very fair approximation to the dimensions of the Earth; one, in fact, that comes within about 19,000 feet of the true length of the radius; but from what source they had obtained their information is more than I am able to explain.

Upsala, 1873, *July* 25.

Observations of a portion of the Moon's limb, not on the Sun's disk, during the late Solar Eclipse. By Henry Pratt.

The attention of the last meeting having been drawn by Capt. Noble to a hitherto unrecorded phenomenon observed by him during the partial eclipse of May 26th, 1873, a few additional notes of a similar and independent observation made by myself may not be without interest.

During the Eclipse the Sun was occasionally obscured by clouds for short intervals, often its light was diminished by a thin veil of haze, and again at other intervals it was perfectly clear

* שתא אלפי פרסי הוי עלמא.

and well defined. The telescope chiefly used was a silvered-glass reflector, one of With's most exquisite specula of $8\frac{1}{8}$-in. aperture in conjunction with one of Browning's perfect planes *unsilvered;* and which is at once a most simple and effective arrangement for solar observation, being the equivalent of a Hodgson eye-tube with a less number of reflecting surfaces. This means together with the tarnished state of my speculum reduced the light so that *no dark glass was needed.* The outline of the Moon's edge projected on the solar disk was of course finely seen, some of the peaks of the Dörfel Range being recognised by their profiles. After the eclipse had passed its greatest phase, the Moon's limb was seen to be traceable for some distance beyond the Sun's disk on the eastern side, and in a less degree on the western side. It was first detected with a Kelner power 85, *without a dark glass*, and its visibility estimated to extend beyond the Sun for a distance of about five minutes of arc on the eastern side. Beyond this distance it faded from view, was at no part very easily to be seen, but most so nearest to the Sun. A blue glass was now applied through which it was still visible, but not to so great an extent as without it, probably merely on account of the diminution of light. The eye-piece was now exchanged for a Kelner 45, *with* the dark glass, the phenomenon being still traceable, but not so clearly so as with 85. The effect of different eye-pieces was tested by substituting a Ramsden 170 *without* and *with* a *red* glass, and afterwards a Huyghenian 180, *without* and *with* a wedge of *neutral tint*, always with the same result, with the exception of variations in the extent of the Moon's limb rendered visible. The power 85 was the most efficient.

A small achromatic telescope by Cooke of 2·5 in. aperture was now turned on the object. It was armed with a Hodgson plane and a Huyghenian eye-piece 70 *with* a neutral tint dark glass, and afterwards with another negative eye-piece 160 *without* a dark glass. The phenomenon was as certainly perceived, but neither so easily nor for so great a distance from the Sun as with the larger telescope. It was observed alternately in the two instruments until the termination of the eclipse, when a cloud intervened for a few seconds, and after it had cleared off not the slightest trace of the Moon could be perceived. Whatever the cause of the appearance may be it is thus proved to be not of instrumental origin. And it is as remarkable that it became invisible at a short distance from the Sun as it is that it was most easily perceived close to that luminary's limb.* Very probably a large aperture and a weak light without a dark glass

* This seems to accord with the only explanation that can (I conceive) be suggested; viz., that the Moon was seen projected on the light of the solar corona, rendered thus discernible *by its effects.* Mr. Pratt's observations appear to me of great value and interest; and I would venture to invite special attention to the importance of applying, whenever practicable, such tests as he employed to show that the phenomena described were not of instrumental origin.—R. A. P.

may have been conditions greatly assisting me in the observation. It may be noted that a young friend who was with me at the time also saw it in the large telescope, but could not see it in the small one.

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Note on the Preparation of Speculum Metal, by R. L. J. Ellery, F.R.S., the Observatory, Melbourne.

(*Communicated by J. Browning, Esq.*)

In a letter I have received from Mr. Ellery, the following remarks referring to reflecting telescopes, and the preparation of speculum metal, are so interesting that I think they will be considered worthy of a place in the Proceedings of the Society.

Mr. Ellery says, "That for amateurs and many others glass specula up to 10-in. or 12-in. diameter will nearly always be preferred: but that for dimensions greater than these metal would be found the best for many reasons. First, among these is the difficulty of supporting large glass surfaces, and the greater effect strains, whether from defective annealing or defective support, would have upon glass.

"I believe metal surfaces would last almost any time if the metal itself were properly made, and with only ordinary care taken of the polished surface.

"My attention has been drawn to a very important point as regards speculum metal by a gentleman here who has produced a composition the whitest, densest, and most difficult to tarnish I have ever seen, and he has effected this by the most scrupulous avoidance of contact with any iron while the metal was in a molten state. I could not have believed that merely stirring with an iron rod would make such a difference as it does. The metal that has come in contact with iron is always yellower or browner than that which has not, and certainly tarnishes much quicker."

A Method for determining the Heat-radiation from the Solar Spots. By Dr. Lohre, of the Bothkamp Observatory.

(*From a Letter to the Foreign Secretary. Translation.*)

The importance which a correct answer to the question, "Do Sun-spots exhibit a marked difference of heat-radiation from that of the surrounding solar surface?" has upon our interpretation of the processes going on in the Sun induced me to search for some easier way of solving this problem than the ordinary thermo-electric method. It occurred to me that some chemical compounds, which, as is well known, exhibit under a very moderate heat a